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AUTHORITY

ATD ltr, 2 Dec 1965

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⑤ 175"

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AUTHOR:　⑧ Jakubowicz, Antoni

TITLE:　⑥ Technical theory of bending of beams for a certain case of physically non-linear material

PERIODICAL:　⑮ TRANS. FROM Rozprawy inżynierskie, v. 10, no. 3, 1962, pp. 443-457

TEXT:　　　The author considers simple bending of a bar in the uniaxial state of stress with the arbitrary bending moment vector. A power relation

$$\varepsilon = \mathrm{sgn}\ \sigma a\ |\sigma|^{n} \tag{2.1}$$

where a and n are characteristic constants of the material, is assumed. For a bar of any constant cross-section, surface moments of the cross-section profile and the differential equation of the bent neutral axis are derived, with other fundamental relations for stresses and strains. Graphical or numerical methods are used in determining surface moments and the case of rectangular cross-section is solved as an example. Putting $n = 1$ and $a = 1/E$ in (2.1)

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Technical theory ...

results in Hooke's Law and under this assumption, the case of oblique bending is solved. Finally, the above theory is used to determine the limiting load (when the material becomes perfectly plastic) and the creep of the bent bar, the latter case being illustrated by a numerical example. There are 10 figures.

SUBMITTED:　　October 25, 1961

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